AN ECONOMIC SURVEY

OF NEW ZEALAND WHEATGROWERS:

ENTERPRISE ANALYSIS

SURVEY NO. 9

1984-85

R.D. LOUGH

P.J. McCARTIN

RESEARCH REPORT NO. 170

OCTOBER 1985

Agricultural Economics Research Unit

Lincoln College
Canterbury
New Zealand

ISSN 0069-3790

THE AGRICULTURAL ECONOMICS RESEARCH UNIT
Lincoln College, Canterbury, N.Z.

The Agricultural Economics Research Unit (AERU) was established in 1962 at Lincoln College, University of Canterbury. The aims of the Unit are to assist by way of economic research those groups involved in the many aspects of New Zealand primary production and product processing, distribution and marketing.

Major sources of funding have been annual grants from the Department of Scientific and Industrial Research and the College. However, a substantial proportion of the Unit's budget is derived from specific project research under contract to government departments, producer boards, farmer organisations and to commercial and industrial groups.

The Unit is involved in a wide spectrum of agricultural economics and management research, with some concentration on production economics, natural resource economics, marketing, processing and transportation. The results of research projects are published as Research Reports or Discussion Papers. (For further information regarding the Unit's publications see the inside back cover). The Unit also sponsors periodic conferences and seminars on topics of regional and national interest, often in conjunction with other organisations.

The Unit is guided in policy formation by a Review Committee first established in 1982. The AERU, the Department of Agricultural Economics and Marketing, and the Department of Farm Management and Rural Valuation maintain a close working relationship on research and associated matters. The heads of these two Departments are represented on the Review Committee, and together with the Director and Principal, constitute an AERU Management Committee.

UNIT RESEARCH STAFF: 1985

Director
R.G. Lattimore, B.Agr.Sc., M.Agr.Sc.,Ph. D.

Assistant Director
R.L. Sheppard, B.Agr.Sc.(Hons), B.B.S.

Research Fellow in Agricultural Policy
J.G. Pryde, O.B.E., M.A., F.N.Z.I.M.

Senior Research Economist
R.D. Lough, B.Agr.Sc.

Research Economists
D.E.Fowler, B.B.S., Dip. Ag. Econ.
G. Greer, B.Agr.Sc.(Hons)
S.K. Martin, B.Ec., M.A.(Hons.), Dip.Tchg.
R.G. Moffitt, B.Hort.Sc., N.D.H.

Research Sociologist
J.R. Fairweather, B.Agr.Sc., B.A., M.A., Ph.D.

Assistant Research Economists
J.E. Chamberlain, B.Agr.Sc.
T.P. Grundy, B.Sc.(Hons), M.Com.
P.J. McCartin, B.Agr.Com.
P.R. McCrea, B.Com.(Agr), Dip. Tchg.
S.M. Scanlan, B.Com.(Agr).
C. Tait, B.Hort.Sc.

Post Graduate Fellow
P. Seed, B.Com.(Agr)

Secretaries
L.M. Bellamy
R. Searle

CONTENTS

LIST OF TABLES

LIST OF TABLES (Contd.)

LIST OF TABLES (Contd.)

LIST OF FIGURES

PREFACE

This report is the ninth in an annual series of economic surveys of New Zealand wheatgrowing farms. These surveys have been undertaken by the Agricultural Economics Research Unit at Lincoln College on behalf of the Wheatgrowers Sub-Section of Federated Farmers of New Zealand Inc.

Specific attention has been focused on the physical characteristics of wheatgrowing farms, the area of wheat and other crops sown, wheat yields, management practices and costs and returns for the 1984-85 wheat crop. An attempt has been made to allocate plant and machinery overhead costs to the wheat enterprise on a current cost basis. A comparison of this information with past surveys enables a more comprehensive profile of the industry to emerge.

The need for current and detailed information from the survey involved visiting each of the farms in the sample after harvest. This field work was carried out by Patrick McCartin, Susan Morrish, Penny Harvey and Jill Steven. Computer programming and analysis was undertaken by Patrick McCartin. The report was compiled by Roger Lough and Patrick McCartin.

Dr R.G. Lattimore
Director

ACKNOWLEDGEMENTS

The Agricultural Economics Research Unit gratefully acknowledges the co-operation of the wheatgrowing farmers who participated in the survey and who made time and information freely available to our field staff.

CHAPTER 1

INTRODUCTION

The National Wheatgrowers' Survey is an annual survey being undertaken by the Agricultural Economics Research Unit at Lincoln College on behalf of the Wheat Growing Sub-Section of Federated Farmers of New Zealand Inc. This report summarizes information collected from participating farmers for the 1984-85 wheatgrowing season.

1.1 Climatic Conditions

Wright (pers. comm., 1985) provided the following details on weather conditions in the various regions:

In retrospect the 1984-5 season will be remembered for the vast improvement in the quality of the national wheat crop compared with the previous season. It could be considered a good growing season except for the continued drought in North Otago and South Canterbury.

The difference in average quality between the 1983-4 and 1984-5 seasons amounted to 8 MDD points and there was an improvement in quality in all cultivars. The greatest quality improvement occurred in Nelson - Marlborough and the least in North Otago.

There was little sprout damage in this season's crop but there was black point damage particularly in Kopara, Takahe and Tiritea. Kernel weights were lower especially in South Canterbury and the national yield was slightly lower than the previous season, at approximately 4.4 tonnes per hectare.

Canterbury contributed about 73 percent of the crop and the North Island and Southland approximately 12 percent each.

North Island

A dry spring allowed early land preparation. Sowing took place under ideal conditions during September. There was good establishment with regular rainfall and warm temperatures ensuring good early growth.

From November onwards temperatures were higher than normal. Warm, damp weather in late December and January meant high levels of leaf and stripe rust infection. February, however, was very dry and this brought forward harvesting by up to a fortnight earlier than normal. The dry conditions also caused lower than normal seed weights less shattering, lodging and sprouting and less stem rust.

A small area of wheat has been grown in the South

---

1 Wright, D., Crop Research Division, D.S.I.R.

Auckland-Waikato area for several years now and this season about 650 hectares were sown. Yields were not high but bread wheat quality was good.

Canterbury-North Otago

For most of Canterbury mild, dry conditions prevailed throughout the season. Land preparation and sowing for both autumn and spring sown wheat was accomplished without any problems. Establishment was good and growth satisfactory but the soil was a little too dry for optimum growth. Early summer rains made a big difference to subsequent growth and yields. Strong winds prevailed over most of Canterbury from mid-December onwards bringing the harvest forward by about two weeks. Some shedding occurred and even under the dry conditions some lines had black point.

A severe hailstorm in the areas around Sheffield and Kirwee in mid-January caused serious crop losses and in some cases total loss.

Further south in North Otago and South Canterbury the winter and early spring were so dry that many of the crops had poor growth and most of the top part of the wheat heads had sterile spikelets at ear emergence. This seriously reduced yield and some crops were not harvested. Parts of this area also had frost damage after flowering.

Southland-South Otago

This season was the best since 1981-2 with ideal conditions from sowing through to harvest.

Good weather in August and September allowed early land preparation although rain in early October held up sowing. Mild fairly dry conditions prevailed throughout November and December. The January rainfall of 119 mm was well above average (70.5 mm) but much less than the previous three years, 188, 149 and 212 mm. The temperature was mild during January and the high rainfall was not detrimental to the crop. February and March was dry and mild and harvesting was completed by late March; some four to six weeks earlier than the previous two seasons.

Stripe rust was not so evident this season but glume blotch was. There was very little sprouting but black point remains a problem.

Weather Indices

One method of gaining an overall picture of the climatic conditions as they relate to wheat growing is to weight information from the various meteorological stations throughout the country by the area of wheat grown in the vicinity of those stations. This is shown in Table 1, for rainfall, temperature, sunshine and days of soil moisture deficit. Regional climatic data are presented in Appendix A.

TABLE 1

Weather Indices for New Zealand Wheat Growing Areas[a], 1984-85

Month	Rainfall	Average Temperature	Days of Deficit[b]	Sunshine
	Percent of normal[c]	Deviation from normal[c] (°C)	Days	Percent of normal[c]
March	152	+0.6	5.5	80
April	54	+0.2	7.0	112
May	90	-1.0	0.1	99
June	35	+0.9	0.0	73
July	102	+0.9	0.0	73
August	89	+1.1	0.0	98
September	80	0.0	0.0	99
October	63	0.0	1.5	111
November	101	+1.4	3.3	99
December	105	+0.6	2.6	87
January	67	+1.7	17.1	100
February	84	+0.4	14.3	107
March	53	-0.4	16.5	111
April	35	+0.8	18.7	111

a Weighted by county wheat areas in 1967/68.

b The number of "days of deficit" is calculated from daily rainfall data by assuming that evapotranspiration continues at the Thornthwaite potential evapotranspiration rate until 75 mm of soil moisture have been withdrawn. Thereafter, days of deficit are counted until there is a day with rainfall in excess of the daily potential evapotranspiration.

c 1951-80.

Source: Maunder, W.J., N.Z. Meteorological Service, pers. comm., 1985

1.2 Wheat Prices

The New Zealand Wheat Board was responsible, up to 1984, for the purchase from growers of all wheat of milling standard quality, (MDD 12 or greater) except those lines qualifying for acceptance as certified seed wheat under the scheme operated by the Ministry of Agriculture and Fisheries. Lines of wheat that do not meet milling standard are disposed of by the growers themselves, generally for stock feed. In 1984 the Wheat Board announced that starting with the 1984 harvest milling grade wheat would be divided into two categories. Category A being wheat with an MDD score of 15 or greater and category

B with an MDD score of 12-14. Category B wheat would not automatically be purchased by the Wheat Board at the basic wheat price, instead it would be sold by the Wheat Board "to the best advantage".

1.2.1 Announced Prices

Up to the 1980 harvest the delivery prices paid for milling standard wheat, f.o.r. grower's station, (Tables 2 and 3), were fixed by Government and announced prior to sowing. This price also became the maximum price that could be paid for lower quality wheat. Table 2 shows the long term trend in basic wheat prices for wheat varieties Aotea, Kopara, Rongotea and their equivalents. Table 3 details the premiums and discounts applicable to other varieties.

In April 1980 the Minister of Trade and Industry announced that starting with the 1981 harvest the basic wheat price paid to growers would be a three year moving average of the New Zealand equivalent of the f.o.b. price for Australian standard white wheat. The calculation of the basic price included the last two seasons' actual Australian prices and an estimated Australian price for the coming season. The basic wheat price was announced in December prior to harvest. The scheme also provided for a minimum price which in any season will be 90 per cent of the price paid to growers in the previous season.

In June 1982 the Government announced a wage and price freeze thereby holding the basic wheat price at the 1982 level of $203 per tonne. A price increase was applied for within the terms and conditions of the wage and price freeze. This resulted in the basic wheat price being increased to $204 per tonne for the 1983 harvest. A further price increase to $227 per tonne was approved for the 1984 harvest. The announced price to be paid to growers for basic wheat for the 1985 harvest was $274 per tonne.

Trade and Industry officals in conjunction with the Cabinet Economic Committee reviewed the wheat and flour industry in 1984. Their recommendations were accepted by the Government in October of that year and can be summarised as follows:

a) That the mill production quota system would be abolished from February 1987.

b) That from 1987 global licences for flour imports be issued up to 20.0 percent of domestic production.

c) That flour prices be decontrolled with effect from February 1987.

d) That as from February 1987 the Wheat Board would no longer trade in flour.

e) As from February 1987 the Wheat Board would be required to meet mill specifications for wheat, including if necessary imported wheat. The Wheat Board to remain the sole importer of wheat until February 1989 when its monopoly trading and import role would cease and

f) That controls on the importation, marketing and price received for bran and pollard will cease as from February 1987.

The de-regulation of the New Zealand wheat industry will force all sectors of the industry to become competitive regarding price, quality and delivery.

As from the 1981 harvest the New Zealand Wheat Board was empowered to set the levels of premiums and discounts between varieties. Table 3 shows that for the 1985 harvest, relative to the basic wheat price, Oroua wheat classified as Category A received a premium of 5 per cent. Arawa retained a 5 per cent discount. Karamu and Bounty grown in the South Island for biscuit flour contracts were discounted 5 per cent, non-contract Karamu grown in the North Island was discounted 7.5 per cent and in the South Island 15 per cent. Non-contract Bounty was discounted 20 per cent.

TABLE 2

Basic Wheat Price Trend

Harvest Year	Price ($/tonne f.o.r.)	Price Index (1976/77=100)
1966	53.28	48
1967	53.28	48
1968	53.28	48
1969	53.28	48
1970	53.28	48
1971	53.28	48
1972	55.12	50
1973	56.95	52
1974	59.71	54
1975	91.66	83
1976	102.88	94
1977	110.00	100
1978	120.00	109
1979	127.50	116
1980	140.00	127
1981	183.00	166
1982	203.00	185
1983	204.00	185
1984	227.00	206
1985	274.00	249

TABLE 3

Announced Wheat Price Details

Variety	Harvest Year				
	1982 $/tonne	1983 $/tonne	1984 $/tonne	1985 $/tonne	1984-85 % change
Kopara, Rongotea, Takahe and equivalent (basic price)	203.00	204.00	227.00	274.00	+20.7
Hilgendorf	238.53	234.60	227.00	274.00	+20.7
Arawa	192.85	193.80	215.68	267.15	+23.9
Contract Karamu and Bounty S.I. Growers (excl. Marl.)[a]	203.00	204.00	227.00	260.30	+14.7
N.I. Growers (incl. Marl.)	203.00	204.00	227.00	274.00	+20.7
Non-Contract Karamu S.I. Growers (excl. Marl.)	303.55	173.40	192.95	232.90	+20.7
N.I. Growers (incl. Marl.)	187.78	188.70	209.98	253.45	+20.7
Non-Contract Bounty				219.20	

a Marlborough growers were included with the North Island growers as from the 1982 harvest.

1.2.2 Levies

The announced prices are subject to a maximum percentage levy struck on the basic wheat price by the Wheat Board to offset any losses made from exporting wheat. No retention levy was struck for category A wheat for the 1984-85 season. Category B wheat plus non-contract Karamu and non-contract Bounty however, attracted a 12.5 per cent or $34 per tonne retention. Table 4 sets out the additional wheat levies payable by growers during 1984-85.

TABLE 4

Additional Wheat Levies, 1984-85

	$ per tonne
Wheat Research Institute	0.49
United Wheatgrowers (NZ) Ltd	0.63
Federated Farmers of NZ Inc.	0.03
	1.15

1.2.3 Monthly Storage Increments

The storage increment rates for the 1985 harvest applying to wheat grown north of a line from Waikouaiti to Queenstown in the South Island, are given in Table 5. Increment payments on wheat grown south of the Waikouaiti to Queenstown line apply one month later.

TABLE 5

Growers' Storage Increments

Date Sold		Storage Increment Standard Cultivars ($ per tonne) 1981	1982	1983	1984	1985
April	1-15	4.12	4.57	4.57	5.11	6.17
	16-30	5.49	6.09	6.09	6.81	8.22
May	1-15	6.86	7.61	7.61	8.51	10.28
	16-31	8.24	9.14	9.14	10.22	12.33
June	1-15	9.61	10.66	10.66	11.92	14.39
	16-30	10.98	12.18	12.18	13.62	16.44
July	1-15	12.36	13.70	13.70	15.32	18.50
	16-31	13.73	15.23	15.23	17.03	20.55
August	1-15	15.10	16.75	16.75	18.73	22.61
	16-31	16.47	18.27	18.27	20.43	24.66
September	1-15	17.85	19.79	19.79	22.13	26.72
	16-30	19.22	21.32	21.32	23.84	28.77
October	1-15	20.59	22.84	22.8	25.54	30.83
	16-31	21.96	24.36	24.36	27.24	32.88
November	1-15	23.34	25.88	25.88	28.94	34.94
	16-30	24.71	27.41	27.41	30.65	36.99

1.3 Survey Description

The sampling unit for the survey is a wheatgrowing farm. For the purpose of this survey, a wheatgrowing farm is defined as any farm which has delivered wheat to the Wheat Board over the most recent five year period for which records were available. The most recent five year period for which records were available was 1980 to 1984. Approximately 75 per cent of those who participated in the 1983-84 survey (Survey No. 8) were retained for the 1984-85 survey.

Information relating to the farm, its management, crop and livestock enterprises, wheatgrowing costs and returns were obtained from farmers by personal interview, conducted on a farm visit following the 1985 harvest. Since one of the objectives of the survey is to collect information on total crop areas and livestock numbers farms not actually growing wheat in 1984-85 were retained in the sample.

1.3.1 Stratification

To ensure that various regions within the industry were adequately represented, the sample was stratified by region. Four regions were specified for the purposes of the survey and growers' names were allocated to those regions based on the rail station from which wheat was despatched. The regions were defined as follows:

1. North Island;

2. Central Canterbury - South Island growers north of the Rangitata River;

3. South Canterbury - South Island growers north of Palmerston and south of the Rangitata River; and

4. Southland - South Island growers south of Palmerston.

1.3.2 Survey Farm Distribution

Table 6 compares the regional distribution of surveyed farms with the estimated regional distribution of all wheat growing farms. Since wheat may have been sold under more than one name from the same farm over the 1980 to 1984 base period (due to farm sales or internal transfers) the number of names on the Wheat Board records is likely to be higher than the number of wheatgrowing farms. In order to determine the proportion of total number of wheatgrowing farms which occur in each region, it is assumed the ratio of farms to names is the same for each region. Hence the proportion of the population (farms) in each region is the same as the proportion of names on the Wheat Board records in each region. Some caution should be exercised interpreting North Island results because of the number of farms surveyed.

TABLE 6

Distribution of Survey Farms
and Survey Population by Region, 1984-85

	Total Number of Wheatgrowers	Number of Farms Surveyed	Proportion of farms Surveyed	Estimated Proportion of Total Farms
North Island	753	18	0.10	0.12
Central Canterbury	2444	73	0.41	0.41
South Canterbury	997	33	0.19	0.17
Southland	1780	52	0.30	0.30
	5974	176	1.00	1.00

Source: Mitchell, S., N.Z. Wheat Board, pers. comm., 1984.

1.3.3 Weighting

Estimates of farm characteristics were obtained by taking each survey farm characteristic and then calculating the average for all farms. The regional data are therefore expressed as the average per farm.

In assessing the "All Regions" data each region assumes its correct degree of importance through using the estimated proportion of total farms in each region (Table 6) to weight regional survey results. This weighting is applied to the average result for each region so arriving at an "average farm" result for "All Regions".

The "National Average" is the average per production or financial unit. For example, total wheat production is divided by total wheat area thereby determining the average yield per hectare as distinct from the average yield per hectare per farm as in the "All Regions" average. The "National Average" has been assessed for wheat growing farms only.

CHAPTER 2

FARM CHARACTERISTICS

This chapter outlines some general survey farm characteristics. The figures presented are averages for all survey farms and hence include some farms which did not grow wheat in the 1984-85 season. As such this chapter describes the arable wheatgrowing sector as a whole.

Table 7 shows the number of survey farms which grew wheat in 1984-85, as well as those which had grown wheat in previous seasons but for a number of management reasons, failed to do so in the 1984-85 season.

TABLE 7

Classification of Farms Surveyed, 1984-85

	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Farms which harvested wheat	14	62	25	25	126
Farms which did not grow wheat	4	11	8	27	50
Total:	18	73	33	52	176

2.1 Property Values

Tables 8 and 9 present the average value of survey farms for the different regions on total value and value per hectare bases respectively. These values were determined from the most recent Government valuation (within the past five years), updated by the use of the Valuation Department's "Farmland Sales Price Index" to June 1984.

TABLE 8

Government Valuation of Survey Farms, 1984-85

($ per farm)[a]

	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms	18	73	33	52	176
Land Value	584,306	526,953	408,060	441,225	487,905
Value of Improvements	168,851	177,417	152,238	184,982	174,378
Capital Value	753,157	704,370	560,298	626,207	662,283

a Most recent Government valuation updated by the Valuation Department's "Farmland Sales Price Index"

TABLE 9

Government Valuation per Hectare, 1984-85

($/ha per farm)

	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms	18	73	33	52	176
Land Value	1,824	2,950	1,973	2,453	2,500
Value of Improvements	529	900	773	1,018	869
Capital Value	2,353	3,850	2,746	3,471	3,369

2.2 Crop Areas and Production

Table 10 shows average farm size and crop areas harvested in 1985. Wheat and barley were the major crops grown. The "All Regions" average wheat area harvested was 17.2 hectares while the barley area harvested was 25.7 hectares. The area of Grass seed harvested was 2.3 hectares and white clover 5.3 hectares. The area of wheat harvested ranged from 7.2 hectares per farm in Southland to 26.2 hectares per farm in Canterbury. South Canterbury farms harvested the largest area of barley with 33.9 hectares per farm, while North Island farms harvested 12.9 hectares. Canterbury farms harvested the largest area of small seeds at 13.6 hectares.

TABLE 10

Farm and Crop Areas, 1984-85
(per farm)

	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms	18	73	33	52	176
Farm Area:					
Total Farm Area (ha)	253.7	187.4	187.2	185.7	194.8
Potential Cropping Area (ha)	156.2	166.8	158.6	158.5	161.6
Potential Cropping Area as a Prop'n of Total Farm Area (%)	62	89	85	85	83
Cash Crop:					
Area Harvested (ha)					
Wheat Area [a]	14.0	26.2	15.2	7.2	17.2
Barley Area	12.9	28.9	33.9	22.0	25.7
Seed Peas Area	3.0	10.3	2.9	0.2	5.1
Vining Peas Area	1.1	0.5	2.2	0.0	0.7
Oats Area	0.1	2.1	0.7	3.1	1.9
Linseed Area	0.0	0.0	0.0	0.0	0.0
Oilseed Area	0.0	0.3	0.0	0.0	0.1
Potatoes Area	0.0	0.7	1.0	0.0	0.5
Maize Area	0.0	0.2	0.4	0.0	0.1
Grass Seed Area	2.2	3.6	3.1	0.1	2.3
Clover Seed Area	1.5	10.0	5.6	0.2	5.3
Other Cash Crop Area	3.4	4.5	2.1	1.9	3.2
Total Cash Crop Area Harvested	38.2	87.3	67.1	34.7	62.1
Wheat Area as a Prop'n of Total Cash Crop Area (%)	37	30	23	21	28

a Average wheat areas harvested and production for all survey farms in 1984-85 are shown in Table 11. Similar details for only those farms which grew wheat are given in Chapter 3.

Since all survey farms are included, production is a function of the number of farms growing wheat and the average yield on those farms. Relative to 1983-84, the "all regions" average wheat area decreased by 1.1 percent to 17.2 hectares and the average yield per hectare decreased by 10 percent to 4.5 tonnes per hectare, this resulted in a fall in production per farm by 10.7 percent from 87.5 tonnes to 78.1 tonnes per farm (Table 11).

TABLE 11

Wheat Area, Production and Yield
on all Survey Farms, 1984-85 (per farm)

	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms	18	73	33	52	176
Area Harvested (ha)	14.0	26.2	15.2	7.2	17.2
Production (tonnes)	65.5	118.6	59.6	38.1	78.1
Production per Hectare of Crop Grown (tonnes/ha)	4.7	4.5	3.9	5.3	4.5

Average areas and yields for crops other than wheat are presented in Table 12. The increase in barley production since 1982 has continued. While the number of growers remained constant at 153 (156 in 1983-84) the area per farm increased by 39.2 percent from 24.0 hectares in 1983-84 to 29.4 hectares in 1984-85. Barley, vining peas and grass seed per hectare production was less than the previous season while seed peas, oats, and potatoes per hectare production was greater than the previous season.

2.3 Livestock Numbers

Average livestock numbers and total stock units per farm are presented as at 30 June, and at 31 December (Table 13). A comparison of the June figures with the previous survey shows that stock units per hectare on farms which grew wheat increased from 15.7 to 16.0 while the lambing percentage increased relative to the 1983-84 survey figures. On non-wheat growing farms the stocking rate decreased from 14.2 to 13.5 stock units per hectare. A comparison as at 31 December with 1982-83 survey figures shows that carrying capacity per hectare increased from 17.2 to 20.1 stock units per hectare.

TABLE 12

Other Crop Yields by Region, 1984-85 (per farm)

	No. of farms Which Recorded Yield	Area Harvested[a] (ha)	Av. Yield (tonnes/ha)[b]	No. of farms Which Recorded Yield	Area Harvested[a] (ha)	Av. Yield (tonnes/ha)[b]
	North Island			Central Canterbury		
Barley	14	16.7	4.4	67	31.4	4.7
Peas (seed)	5	10.8	4.1	40	18.9	3.4
Peas (vining)	2	10.0	5.9	2	18.0	4.4
Oats	0	0.0	0.0	16	9.7	4.1
Linseed	0	0.0	0.0	0	0.0	0.0
Oilseed Rape	0	0.0	0.0	0	0.0	0.0
Potatoes	0	0.0	0.0	7	7.5	19.5
Maize	0	0.0	0.0	0	0.0	0.0
Grass Seed (md)	4	9.9	0.7	21	12.5	0.9
Clover Seed (md)	0	0.0	0.0	27	26.9	0.3
	South Canterbury			Southland		
Barley	30	37.3	4.5	42	27.2	5.7
Peas (seed)	6	16.2	3.0	0	0.0	0.0
Peas (vining)	5	14.7	4.3	0	0.0	0.0
Oats	4	5.9	3.1	14	11.4	5.2
Linseed	0	0.0	0.0	0	0.0	0.0
Oilseed Rape	0	0.0	0.0	0	0.0	0.0
Potatoes	4	8.4	28.5	0	0.0	0.0
Maize	0	0.0	0.0	0	0.0	0.0
Grass Seed (md)	8	12.7	0.8	0	0.0	0.0
Clover Seed (md)	11	16.7	0.3	0	0.0	0.0
	National Average					
Barley	153	30.1	4.9			
Peas (seed)	52	17.6	3.4			
Peas (vining)	9	14.4	4.6			
Oats	35	9.7	4.5			
Linseed	0	0.0	0.0			
Oilseed Rape	0	0.0	0.0			
Potatoes	12	7.3	22.6			
Maize	0	0.0	0.0			
Grass Seed (md)	34	12.0	0.8			
Clover Seed (md)	40	23.7	0.3			

Notes

a Average for all survey farms which grew the crop.

b Average for farms which recorded a yield.

Where only one grower is represented in a region his individual returns have not been itemised but they have been included in the National Average.

TABLE 13

Livestock Numbers, 1984-85 (per farm)

	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms	18	73	33	52	176
Farm Area					
Total Farm Area (ha)	253.7	187.4	187.2	185.7	194.8
Livestock Numbers at 30.6.84					
Ewes	1319	1137	994	1721	1310
Other Sheep	586	214	132	380	294
Cattle	920	50	11	53	149
Total Stock Units	2825	1401	1137	2154	1753
Stock Units per Available Spring Grazing Area (S.U./ha)					
a) Wheat Farms	17.8	16.8	14.6	15.3	16.0
b) Non-wheat Farms	12.4	13.8	8.9	16.3	13.5
Lambing %					
a) Wheat Farms	111	110	99	122	116
b) Non-wheat Farms	114	119	121	126	120
Livestock Numbers at 31.12.84					
Ewes	1508	1070	993	1646	1282
Other Sheep	716	552	275	1306	751
Cattle	808	46	10	62	136
Total Stock Units	3032	1668	1278	3013	2169
Stock Units per Available Summer Grazing Area (S.U./ha)	14.6	17.4	12.7	18.5	16.4

Stock Unit Conversions (per head)

Sheep:	Ewes	1.0 S.U.	Cattle:	Cows	6.0 S.U.
	Hoggets	0.6 S.U.		Calves	3.0 S.U.
	Others	0.8 S.U.		Bulls	5.0 S.U.

CHAPTER 3

CHARACTERISTICS OF WHEAT PRODUCTION

This chapter deals with wheat area and yield for the 126 survey farms which grew wheat in the 1984-85 season.

3.1 Wheat Area and Production

Table 14 shows that the "All Regions" average survey farm which havested wheat in 1984-85 harvested 22.7 hectares of wheat and produced 104.5 tonnes at an average farm yield of 4.6 tonnes per hectare. This yield was 8.0 percent less than the 5.0 tonnes per hectare recorded for the 1983-84 survey.

The distribution of survey farms which harvested wheat by area drilled is shown in Table 15 and Figure 1. The majority (60.2 percent) of farms which drilled wheat, drilled less than 20 hectares. Another 25.8 percent drilled between 20 and 40 hectares.

TABLE 14

Wheat Area, Production and Yield
on Survey Farms which Harvested Wheat, 1984-85
(per Farm)

	North Island	Central Canterbury	South Canterbury	South-land	All Regions	National Average
Number of Survey Farms which Harvested Wheat	14	62	25	25	126	126
Area Harvested (ha)	18.0	30.9	20.0	15.0	22.7	24.1
Production (tonnes)	84.3	139.7	78.6	79.2	104.5	109.3
Yield (tonnes/ha)	4.7	4.5	3.9	5.3	4.6	4.5

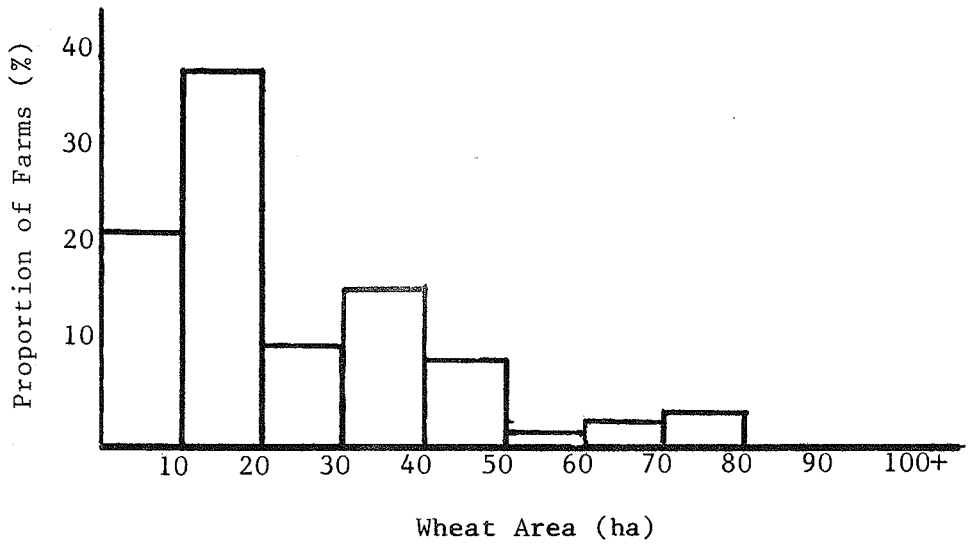
TABLE 15

Distribution of Wheat Area Drilled, 1984-85

	Proportion of Farms (%)				
	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms which Harvested Wheat	14	62	25	25	126
Wheat Area Drilled (ha):					
0- 9.99	21.4	12.9	24.0	32.0	21.5
10-19.99	42.9	24.2	40.0	56.0	38.7
20-29.99	14.3	11.3	16.0	0.0	9.1
30-39.99	21.4	27.4	4.0	4.0	15.7
40-49.99	0.0	12.9	12.0	4.0	8.5
50-59.99	0.0	3.2	0.0	0.0	1.3
60-69.99	0.0	0.0	4.0	4.0	1.9
70-79.99	0.0	6.5	0.0	0.0	2.7
80-89.99	0.0	1.6	0.0	0.0	0.7
90-99.99	0.0	0.0	0.0	0.0	0.0
100 & above	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0

FIGURE 1

Distribution of Wheat Area Drilled, 1984-85



Because some wheat is sold as feed wheat and some retained for seed, the Wheat Board does not purchase the total wheat production in any one year. Table 16 gives an estimate of the amount of Category A wheat sold per farm to the Wheat Board from the 1985 harvest. From an average total production per farm of 104.5 tonnes, 79 percent or 82.1 tonnes per farm was estimated as being sold to the Wheat Board. This is 14.0 percent greater than for the 1983-84 survey. Thirty-nine percent of total wheat production from the North Island survey farms was expected to be sold to the Wheat Board compared to the 71 percent sold to the Wheat Board during 1983-84, and 84 percent in 1982-83. The lower overall figure in 1983-84 resulted from wet weather at harvest in Southland with only 13 percent of the crop reaching minimum milling grade standard (at harvest time) with further deterioration in store, due to "Black Spot" disease.

TABLE 16

Estimated Wheat Production Sold to the Wheat Board, 1985 Harvest (per farm)

	North Island	Central Canterbury	South Canterbury	South-land	All Regions	National Average
Number of Survey Farms which Harvested Wheat	14	62	25	25	126	126
Total Production (tonnes)	84.3	139.7	78.6	79.2	104.5	109.3
Estimated Wheat Sold to the Wheat Board[a] (tonnes)	32.9	114.5	70.1	64.4	82.1	87.4
Wheat Sold to Wheat Board as a Proportion of Total Prodn.(%)	39	82	89	81	79	80

a This is an estimate based on wheat which had been sold at the time of the survey visit (post harvest) plus any which was still in store, taking into account quality and own seed requirements.

3.2 Wheat Varieties, Areas and Yields

Table 17 and Figure 2 show that on the "All Regions" average farm, Rongotea was the most important variety, being sown on 33.2 percent of the total wheat area drilled. This was followed by Oroua (23.2 percent), Karamu (12.8 per cent), Takahe (10.9 percent) and Kopara (8.7 percent).

The proportion of Rongotea drilled increased from less than 1.0 percent in 1979-80 to a peak of 35.5 percent in 1983-84. It decreased 6.5 percent to 33.2 hectares in 1984-85. Kopara has decreased from 38 percent in 1979-80 to 8.7 per cent in 1984-85. In 1983-84 Tiritea made up 19.5 percent of the Southland crop and nearly 7 percent of the national crop. It decreased to 2.5 percent of the Southland crop and less than 1 percent of the national crop for 1984-85. Takahe has declined as a percentage of both the Southland and national crop for the third year. Oroua, 12.4 percent of the national crop in 1983-84 increased to 23.2 percent in 1985, with the largest increase in Southland from 14.6 percent in 1983-84 to 38.8 percent in 1984-85.

TABLE 17

Wheat Varieties by Proportion of Wheat Area Drilled, 1984-85 (per farm)

	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms which Harvested Wheat	14	62	25	25	126
	Proportion of Wheat Area Drilled (%)				
Wheat Variety					
Kopara	0.0	5.9	2.9	17.5	8.7
Karamu	62.0	9.5	10.9	0.0	12.8
Bounty	0.0	5.6	6.5	0.0	3.2
Takahe	0.0	0.0	0.0	32.9	10.9
Advantage	0.0	4.0	2.2	0.0	2.0
Tiritea	0.0	0.0	0.0	2.5	0.8
Arawa	0.0	3.8	3.6	0.0	2.1
Oroua	5.7	14.0	30.9	38.8	23.2
Rongotea	32.3	55.5	37.7	3.2	33.2
Other	0.0	2.1	5.3	5.1	3.2
Total	100.0	100.0	100.0	100.0	100.0

FIGURE 2

Wheat Varieties by Proportion of Wheat Area Drilled, 1984-85 (per farm)

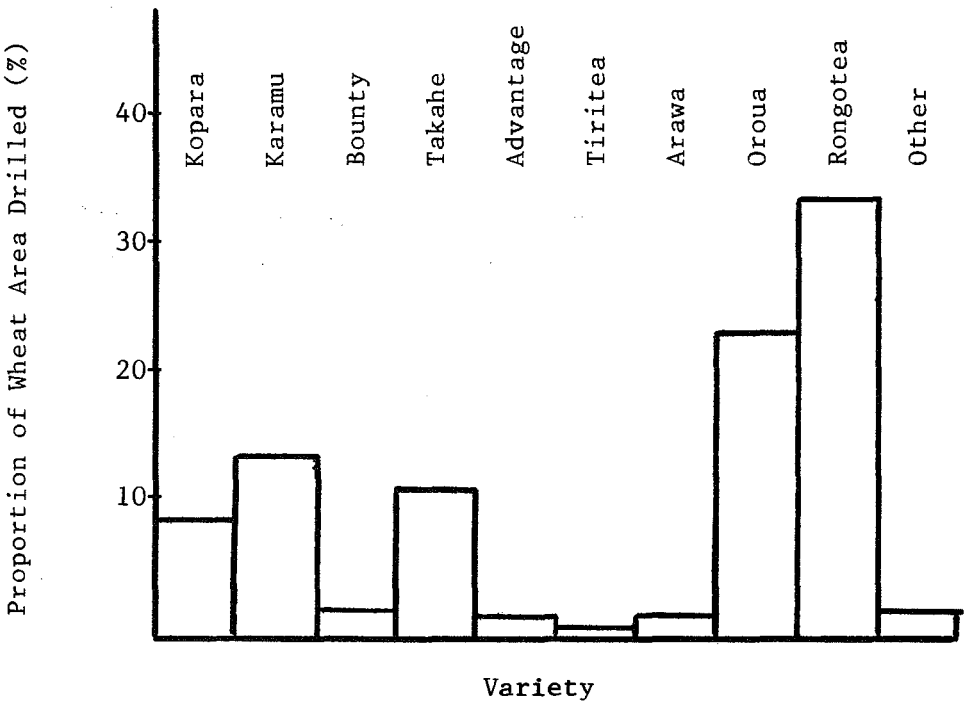


Table 18 presents wheat area and yield per hectare for the different varieties recorded on the survey. Where a single crop of any variety has been grown in a region, the details have been deleted from the regional analysis but included in the "National Average" figures, except where only a single crop was grown nationally in which case national figures are also deleted. The "National Average" shows that Advantage outyielded all other varieties.

TABLE 18

Wheat Area and Yield by Variety, 1984-85 (per farm)

	No. of Farms which Harvested Variety	Area Harvested (ha)	Av. Yield (tonnes/ha)	No. of Farms which Harvested Variety	Area Harvested[a] (ha)	Av. Yield (tonnes/ha)
	North Island			Central Canterbury		
Karamu	10	15.7	4.7	13	14.0	4.0
Kopara	0	0.0	0.0	6	18.6	4.5
Aotea	0	0.0	0.0	9	11.9	5.1
Tiritea	0	0.0	0.0	0	0.0	0.0
Oroua	0	0.0	0.0	22	12.2	3.8
Rongotea	5	16.3	4.7	38	27.8	4.8
Takahe	0	0.0	0.0	0	0.0	0.0
Arawa	0	0.0	0.0	5	14.3	4.1
Advantage	0	0.0	0.0	9	8.3	5.3
Other	0	0.0	0.0	4	10.2	4.0
	South Canterbury			Southland		
Karamu	0	0.0	0.0	0	0.0	0.0
Kopara	0	0.0	0.0	6	11.0	5.2
Aotea	3	10.9	4.1	0	0.0	0.0
Tiritea	0	0.0	0.0	0	0.0	0.0
Oroua	10	15.6	4.3	9	16.2	6.3
Rongotea	13	14.6	3.9	0	0.0	0.0
Takahe	0	0.0	0.0	11	11.2	4.5
Arawa	0	0.0	0.0	0	0.0	0.0
Advantage	2	5.5	3.9	0	0.0	0.0
Other	3	8.9	4.3	3	6.3	6.0
	National Average					
Karamu	28	9.5	4.1			
Kopara	13	13.4	4.7			
Aotea	12	6.8	4.8			
Tiritea	0	0.0	0.0			
Oroua	42	14.3	4.6			
Rongotea	57	19.4	4.7			
Takahe	11	3.4	4.5			
Arawa	6	9.0	3.8			
Advantage	11	4.4	5.1			
Other	10	7.6	4.5			

Notes

a Averages apply to only those farms that harvested this variety.

Where only one grower is represented in a region his individual returns have not been itemised but they have been included in the National Average.

CHAPTER 4

MANAGEMENT PRACTICES AND MACHINERY DETAILS

Some of the management practices employed on survey farms which grew wheat in 1984-85 along with farm machinery details, are summarised in this chapter.

4.1 Management Practices

Average sowing and harvesting dates varied considerably among regions (Table 19). For the North Island and Southland properties wheat is almost exclusively a spring sown crop, whereas the majority of Central and South Canterbury crops are autumn sown. Compared with 1983-84, the drilling date for Central Canterbury was 30 days later, the North Island was nine days earlier, South Canterbury ten days earlier and Southland ten days earlier. The harvest in all regions was earlier than the preceding year. In Central and South Canterbury the harvest was 22 days earlier, in Southland 11 days earlier and in the North Island 13 days earlier.

TABLE 19

Drilling and Harvesting Dates, 1984-85
(per Farm)

	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms which Harvested Wheat	14	62	25	25	126
Drilling Date 1984	Oct 4	Jun 25	Jul 1	Sept 12	Aug 1
Harvesting Date 1985	Feb 12	Jan 22	Jan 28	March 13	Feb 10

Average drilling rates for the four survey regions are shown in Table 20. These rates are similar to previous years.

TABLE 20

Drilling Rates, 1984-85
(kg/ha per farm)

	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms which Harvested Wheat	14	62	25	25	126
Drilling Rate	160	141	136	169	151

Table 21 lists a number of management practices which were involved in growing and harvesting the wheat crop and the proportion of survey farms that undertook these practices. A given practice is regarded as having been undertaken on a farm even if it is only applied to part of the total wheat crop. For example, only part of the wheat crop may have been undersown with clover or only part of the wheat crop may have had nitrogenous fertiliser topdressed.

Compared with the previous season the use of nitrogen fertiliser at drilling declined in both Central Canterbury and Southland, however, both regions showed an increased use of nitrogen fertiliser for topdressing. The use of weedicides was less than the previous season. Dry growing conditions associated with increased investment into irrigation increased irrigation used in both Central and South Canterbury. The incidence of grain drying in all regions showed a decrease compared to the previous season.

TABLE 21

Management Practices, 1984-85

	Proportion of Farms (%)				
	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms which Harvested Wheat	14	62	25	25	126
Management Practice					
Wheat Crop Undersown with Clover	0	6	0	0	2
Fertiliser Applied at Drilling	100	85	92	100	92
Nitrogenous Fertiliser Applied at Drilling	100	37	31	61	51
Nitrogenous Fertiliser Topdressed	31	67	23	45	49
Weedicide Used	93	83	76	96	87
Fungicide Used	56	70	50	80	68
Insecticide Used	37	27	7	3	18
Wheat Irrigated	0	21	5	3	10
Grain Dried	12	0	13	61	22

4.2 Machinery Details

Tractor running costs involved in cultivation and drilling and the associated labour costs form a substantial proportion of the establishment costs (Table 44); therefore, average tractor hours for cultivation and drilling are presented in Table 22.

The time spent in cultivation for the "All Regions" survey farm of 2.81 hours per hectare was 0.22 hours per hectare less than the previous year. Drilling time of 0.79 hours per hectare was greater than the previous year (0.73 hours per hectare).

TABLE 22

Tractor Hours for Wheat Cultivation and Drilling, 1984-85
(hours per ha per farm)

	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms which Harvested Wheat	14	62	25	25	126
Tractor Cultivation Time	2.31	2.68	3.29	2.90	2.81
Tractor Drilling Time	0.76	0.79	0.89	0.76	0.79

Information relating to tractor usage, repair costs and values is shown in Table 23. Nineteen percent of all tractors were less than 60 horsepower, 54 percent were 61-85 horsepower and 27 percent were over 85 horsepower reflecting a marginal decline in medium tractors and a corresponding increase in small and large tractors. Of the total hours worked by all tractors, the 61-85 horsepower tractors contributed 58 percent, the less than 60 horsepower tractors contributed 10 percent and the greater than 85 horsepower tractors contributed 32 percent. The number of hours worked by the medium sized tractors has remained constant relative to the 1983-84 survey figures, while the hours worked by the small tractors decreased from 13 percent to 10 percent, and the large tractors increased from 29 percent to 32 percent.

As for the 1983-84 survey, Table 24 indicates a large proportion of Central Canterbury and South Canterbury wheatgrowers used their own header to harvest their wheat crops. The proportion of Southland wheatgrowers using their own header has increased from 39 per cent in 1979-80 to 71 percent in 1984-85 while North Island farmers favoured the use of contract harvesting. On average, 75 percent of farms used only their own header and 25 percent used contractors only. Unlike previous seasons in 1984-85 no farmers used contractors in association with their own headers or sold their wheat crop standing.

TABLE 23

Tractor Usage, Repair Costs and Value, 1984-85

	Less than 60 h.p.			61-85 h.p.			Above 85 h.p.		
Age of Tractor (yrs)	0-5	6-10	11+	0-5	6-10	11+	0-5	6-10	11+
Number of Tractors	2	5	41	47	44	45	45	20	4
Annual Usage [a] (Hours/Tractor)	331	256	177	476	400	265	428	402	232
Annual Repair Cost ($/Tractor)	53	93	136	387	594	285	355	1276	413
Repair Cost ($/Hour)	0.16	0.36	0.77	0.81	1.48	1.07	0.83	3.17	1.78
Value of Tractors at Cost Price ($)	18,750	6,590	2,533	24,233	9,940	4,603	35,366	19,499	12,200

a For all tractors the annual usage was 353 hours per tractor.

TABLE 24

Harvesting Method, 1984-85

	Proportion of Farms (%)				
	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms which Harvested Wheat	14	62	25	25	126
Own Header	25	88	89	71	75
Contractor	75	12	11	29	25
Own Header and Contractor	0	0	0	0	0
Sold Standing	0	0	0	0	0

CHAPTER 5

COSTS AND RETURNS

5.1 Selected Costs and Returns

Table 25 reports costs and returns on a per hectare of wheat harvested basis while Table 26 lists the results on a per tonne harvested basis. Gross revenue from wheat growing was estimated from the price received for, or value of, wheat at the completion of harvesting. No storage increments were assessed and no costs relating to the storage of wheat were included. Retentions, levies and weighing costs were deducted from the wheat price.

Although the costs outlined are reasonably comprehensive, no attempt has been made to present a total or complete cost-of-production figure. The figures presented include all major variable wheat costs up to and including harvesting plus any wheat cartage to f.o.r. In addition, an estimate of overhead costs relating to farm machinery used on wheat was calculated.

For the purpose of tabulating results the selected costs have been classified into the following groups:

1. Establishment Costs;
2. Growing Costs;
3. Harvesting Costs;
4. Cartage Costs; and
5. Machinery Overhead Costs.

Total variable costs are subtracted from gross revenue to give a gross margin estimate from which machinery overheads are then subtracted. Land is assumed to be a fixed cost and as such no rental figure has been imputed. Statistical information relating to the reliability of these costs and returns is given in Appendix B.

In the short run, wheat should continue to be grown as long as it offers growers the promise of a sufficiently attractive gross margin relative to other stock and crop enterprises. In the longer run, however, growers are faced with the prospect of replacing machinery and if returns from wheat growing are not sufficiently high, enterprises with similar gross margins but lower machinery inputs will become more attractive. The allocation of machinery overhead costs has been undertaken so that the significance of this aspect of wheat growing may be assessed.

TABLE 25

Wheat Costs and Returns per Hectare, 1984-85

	Average Cost (Return) per Hectare per Farm ($/ha)					
	North Island	Central Canterbury	South Canterbury	Southland	All Regions	National Average
Number of Survey Farms which Harvested Wheat	14	62	25	25	126	126
1. Establishment Costs	231.74	164.80	180.61	229.99	194.84	175.48
2. Growing Costs	90.10	172.19	78.98	118.48	130.38	154.29
3. Harvesting Costs	118.43	41.04	45.81	128.78	77.45	53.19
4. Cartage Costs	45.22	49.66	36.68	73.53	54.08	52.13
5. Total Variable Costs[a] (1+2+3+4)	485.49	427.69	342.08	550.78	456.75	435.09
6. Machinery Overhead Costs (Current Cost)	136.52	202.89	196.20	243.08	205.85	196.45
7. Total Selected Costs (5+6)	622.01	630.59	538.28	793.86	662.60	631.54
8. Gross Revenue	1,165.85	1,202.52	942.31	1,323.69	1,190.23	1,227.15
9. Gross Margin (8-5)	680.36	774.82	600.23	772.91	733.48	792.06
10. Gross Margin minus Machinery Overhead Costs (9-6)	543.84	571.93	404.03	529.83	527.63	595.61

a The Cost of farm labour involved in tractor work, drilling and harvesting is included. Tractor repairs and machinery insurance are included under machinery overhead costs.

TABLE 26

Wheat Costs and Returns per Tonne, 1984-85

	Average Cost (Return) per Tonne per Farm ($/ha)					
	North Island	Central Canterbury	South Canterbury	Southland	All Regions	National Average
Number of Survey Farms which Harvested Wheat	14	62	25	25	126	126
1. Establishment Costs	52.14	38.38	58.03	51.19	47.29	38.43
2. Growing Costs	19.75	38.08	20.85	26.32	29.79	33.79
3. Harvesting Costs	27.93	9.11	15.15	28.73	17.60	11.65
4. Cartage Costs	10.03	11.24	11.11	15.40	12.48	11.41
5. Total Variable Costs [a] (1+2+3+4)	109.85	96.81	105.14	121.64	107.16	95.28
6. Machinery Overhead Costs (Current Cost)	28.42	44.37	61.42	56.67	51.09	43.02
7. Total Selected Costs (5+6)	138.27	141.18	166.56	178.31	158.25	138.30
8. Gross Revenue	256.65	267.33	258.45	278.21	268.41	268.71
9. Gross Margin (8-5)	146.80	170.52	153.31	156.57	161.25	173.43
10. Gross Margin minus Machinery Overhead Costs (9-6)	118.38	126.15	91.88	99.90	110.16	130.41

a The Cost of farm labour involved in tractor work, drilling and harvesting is included. Tractor repairs and machinery insurance are included under machinery overhead costs.

In calculating the overhead costs, plant and machinery values used to assess depreciation have been determined on a "current cost" basis. The aim in calculating "current cost" depreciation is to determine the dollar amount which would need to be set aside at the end of the year so that machinery operating capacity could be restored to its original position as at the start of the year. This is achieved by taking account of inflation in machinery prices. Values arrived at by the "current cost" method more closely approximate market values than book values derived by applying the "historical cost" method.

All costs are presented on a before-tax basis. Information for use in this report was collected from farmers well in advance of any taxation accounts being available so that all figures presented would be as current as possible. It should be noted that first year depreciation incentives allowed for by the current taxation laws go some of the way toward transforming the normal historical cost (taxation) depreciation figures into "current cost" equivalents. However, they do not adequately bridge the gap because enterprises not undertaking new investment do not gain from such allowances.

Tables 27 and 28 indicate the importance of various sources of revenue on a per hectare and per tonne basis respectively. Of wheat not sold to the Wheat Board, the most important source of revenue was seed wheat for sale or own use.

TABLE 27

Sources of Wheat Revenue per Hectare, 1984-85

	Average Gross Revenue per Farm ($/ha)					
	North Island	Central Canterbury	South Canterbury	Southland	All Regions	National Average
Number of Survey Farms which Harvested Wheat	14	62	25	25	126	126
Source of Revenue						
1. Wheat Board	485.89	993.40	848.61	953.54	897.98	983.48
2. Stock Feed	249.98	111.44	0.00	58.97	93.38	90.11
3. Seed	429.97	89.27	93.31	311.18	197.41	150.57
4. Sold Standing	0.00	0.00	0.00	0.00	0.00	0.00
5. Insurance Claim	0.00	3.40	0.39	0.00	1.46	2.99
Total Revenue	1,165.85	1,202.52	942.31	1,323.69	1,190.23	1,227.15

TABLE 28

Sources of Wheat Revenue per Tonne, 1984-85

	Average Gross Revenue per Farm ($/Tonne)					
	North Island	Central Canterbury	South Canterbury	Southland	All Regions	National Average
Number of Survey Farms which Harvested Wheat	14	62	25	25	126	126
Source of Revenue						
1. Wheat Board	109.80	224.58	228.70	205.32	205.73	215.36
2. Stock Feed	55.50	22.86	0.00	12.67	19.83	19.73
3. Seed	91.35	19.21	29.66	60.22	41.95	32.97
4. Sold Standing	0.00	0.00	0.00	0.00	0.00	0.00
5. Insurance Claim	0.00	0.68	0.09	0.00	0.29	0.65
Total Revenue	256.65	267.33	258.45	278.21	267.80	268.71

5.2 Distribution of Returns

Tables 29, 30 and 31 show the variation in different measures of return. Fifty to fifty-eight percent of all farms which harvested wheat had a gross revenue per hectare of $900-1400, a gross margin per hectare of $600-1000 and a gross margin less machinery overhead costs per hectare of $300-700. In Canterbury 50 percent of wheat producing farms had a gross revenue per hectare in excess of $1200, a gross margin in excess of $800 per hectare and a gross margin less machinery overhead costs in excess of $500 per hectare.

TABLE 29

Distribution of Gross Revenue, 1984-85

	Proportion of Farms (%)				
	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms which Harvested Wheat	14	62	25	25	126
Gross Revenue ($/ha)					
0 - 100	0.0	0.0	4.0	0.0	0.8
100 - 200	0.0	0.0	0.0	0.0	0.0
200 - 300	0.0	1.6	4.0	0.0	1.6
300 - 400	0.0	0.0	4.0	0.0	0.8
400 - 500	0.0	0.0	0.0	0.0	0.0
500 - 600	0.0	0.0	8.0	4.0	2.4
600 - 700	0.0	3.2	12.0	4.0	4.8
700 - 800	0.0	6.5	4.0	0.0	4.0
800 - 900	7.1	8.1	4.0	4.0	6.3
900 - 1000	35.7	6.5	12.0	4.0	10.3
1000 - 1100	0.0	8.1	8.0	8.0	7.1
1100 - 1200	0.0	12.9	16.0	4.0	10.3
1200 - 1300	28.6	12.9	0.0	12.0	11.9
1300 - 1400	21.4	14.5	12.0	32.0	18.3
1400 - 1500	0.0	8.1	8.0	4.0	6.3
1500 - 1600	0.0	8.1	4.0	4.0	5.6
1600 and above	7.1	9.7	0.0	20.0	9.5
Total	100.0	100.0	100.0	100.0	100.0

TABLE 30

Distribution of Gross Margin, 1984-85

	Proportion of Farms (%)				
	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms which Harvested Wheat	14	62	25	25	126
Gross Margin ($/ha)					
Below 0	0.0	0.0	4.0	0.0	0.8
0 - 100	0.0	1.6	4.0	0.0	1.6
100 - 200	0.0	0.0	8.0	8.0	3.2
200 - 300	0.0	1.6	8.0	4.0	3.2
300 - 400	21.4	3.2	16.0	4.0	7.9
400 - 500	14.3	8.1	0.0	8.0	7.1
500 - 600	0.0	8.1	0.0	12.0	6.3
600 - 700	14.3	16.1	4.0	8.0	11.9
700 - 800	7.1	9.7	20.0	16.0	12.7
800 - 900	28.6	21.0	12.0	8.0	17.5
900 - 1000	7.1	14.5	4.0	12.0	11.1
1000 - 1100	0.0	4.8	16.0	4.0	6.3
1100 - 1200	0.0	8.1	4.0	8.0	6.3
1200 and above	7.1	3.2	0.0	8.0	4.0
Total	100.0	100.0	100.0	100.0	100.0

Tables 30 and 31 highlight the difficulties of covering high machinery overhead costs. While 51.6 percent of growers' gross returns exceeded $1200 per hectare, only 1.6 percent of growers had gross margins less machinery overheads of $1200 per hectare or greater. When adjusted for machinery overheads, 15.1 per cent of growers showed returns of less than $200 per hectare.

TABLE 31

Distribution of Gross Margin less Machinery Overhead Costs, 1984-85

	Proportion of Farms (%)				
	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms which Harvested Wheat	14	62	25	25	126
$/ha					
Below 0	0.0	1.6	16.0	12.0	6.3
0 - 100	0.0	1.6	16.0	0.0	4.0
100 - 200	7.1	3.2	4.0	8.0	4.8
200 - 300	7.1	3.2	8.0	8.0	5.6
300 - 400	14.3	14.5	4.0	8.0	11.1
400 - 500	14.3	9.7	0.0	16.0	9.5
500 - 600	0.0	21.0	4.0	12.0	13.5
600 - 700	42.9	16.1	24.0	8.0	19.0
700 - 800	7.1	14.5	12.0	4.0	11.1
800 - 900	0.0	6.5	4.0	8.0	5.6
900 - 1000	0.0	3.2	4.0	8.0	4.0
1000 - 1100	7.1	4.8	4.0	0.0	4.0
1100 - 1200	0.0	0.0	0.0	0.0	0.0
1200 and above	0.0	0.0	0.0	8.0	1.6
Total	100.0	100.0	100.0	100.0	100.0

5.3 Wheat Profitability Relative to Livestock

This section compares livestock farming with two measures of return from wheat growing. Table 32 shows that at $20 per stock unit, 9.5 percent of all survey wheatgrowing farms had a higher gross margin from livestock than from wheat. Table 33 indicates that at $20 per stock unit, if machinery overhead costs are allowed for, then 19.8 percent of all survey wheatgrowing farms would have a higher adjusted gross margin from livestock than from wheat.

TABLE 32

Livestock versus Wheat Gross Margins, 1984-85

	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms which Harvested Wheat	14	62	25	25	126
Wheat Gross Margin ($/ha)	679.44	774.83	600.23	749.29	726.04
Spring Grazing Stocking Rate (S.U./ha)	17.8	16.8	14.6	15.3	16.0
Livestock Gross Margin at $20 per S.U. ($/ha)	356.0	336.0	292.0	306.0	320.0
Farms with Livestock Gross Margin more than Wheat Gross Margin (%) [a]	7.1 (14.3)	4.8 (9.7)	20.0 (32.0)	12.0 (20.0)	9.5 (15.9)

a Percentages in ( ) assume a livestock gross margin of $25 per stock unit.

TABLE 33

Livestock versus Wheat Gross Margins less Machinery Overhead Costs, 1984-85

	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms which Harvested Wheat	14	62	25	25	126
Adjusted Wheat Gross Margin ($/ha) [a]	542.92	571.93	404.02	506.21	520.19
Spring Grazing Stocking Rate (S.U./ha)	17.8	16.8	14.6	15.3	16.0
Adjusted Livestock Gross Margin at $20 per S.U. ($/ha) [b]	298.54	281.77	244.87	256.61	268.35
Farms with Adjusted Livestock Gross Margin Greater than Adjusted Wheat Gross Margin [c] (%)	14.3 (21.4)	12.9 (17.7)	40.0 (44.0)	20.0 (28.0)	19.8 (25.4)

a Machinery Overhead Costs subtracted

b $20 per stock unit less opportunity cost of livestock estimated at 16.14 percent of $20 per stock unit

c Percentages in ( ) assume a livestock gross margin of $25 per stock unit less opportunity cost of livestock estimated at 16.14 percent of $25 per stock unit.

5.4 Foreign Exchange Component of Total Selected Costs

Table 34 demonstrates the foreign exchange component of total selected costs to f.o.r.

It is apparent that the foreign exchange component of total variable costs is $187.68 per hectare or 43.1 percent of total variable costs. The foreign exchange component of machinery overheads amounts to $38.65 per hectare or 19.7 percent of total machinery overheads, with the result that the foreign exchange component of total selected costs is assessed at $226.33 per hectare or 35.8 percent of total selected costs.

TABLE 34

Foreign Exchange Cost to F.O.R. 1984-85

	National Average $/hectare	Foreign Exchange Component[a](%)	Foreign Exchange $/hectare
Variable Costs			
Fuel and Oil	62.82	85.0	53.40
Seeds	59.29	35.0	20.74
Fertiliser			
- sowing	52.70	70.3	37.05
- topdressing	36.68	70.3	25.79
Agricultural Chemicals			
- weedicides	38.24	35.5	13.57
- insecticides	5.46	35.5	1.94
- fungicides	35.36	35.5	12.55
Transport			
- crop inputs	6.20	21.6	1.34
- crop to f.o.r.	52.13	21.6	11.26
Contracting	43.47	19.4	8.43
Grain Drying	6.32	25.5	1.61
Bags	0.00	18.5	0.00
Labour	27.28	-	-
Insurance	9.14	-	-
Total Variable Costs	435.09	43.1	187.68
Machinery Overhead Costs			
Repairs and Maintenance[b]			
- parts	30.31	46.7	14.15
- labour	15.61	-	-
Depreciation	74.46	32.9	24.50
Interest on Capital @ 16.14%	76.07	-	-
Total Machinery Overheads	196.45	19.7	38.65
Total Selected Costs	631.54	35.8	226.33

a 1976/77 Draft Printout of Input-Output Tables

b Assumes parts are 66.0 percent of total cost

CHAPTER 6

TRENDS IN PRODUCTION, COSTS AND RETURNS

6.1 Wheat Areas

Table 35 compares wheat areas drilled on all survey farms for the 1981-82 to 1984-85 surveys, and lists wheat area intentions for the 1985-86 crop year. These wheat area intentions are the area of wheat farmers were intending to drill at the completion of the 1985 harvest.

TABLE 35

Wheat Areas Drilled and
Wheat Area Intentions for all Survey Farms

	Wheat Area (ha/farm)				
	1981-82 Survey	1982-83 Survey	1983-84 Survey	1984-85 Survey	1985-86 Intentions
North Island	13.3	7.3	12.1	14.0	15.2
Central Canterbury	23.3	22.0	24.2	26.2	31.3
South Canterbury	17.9	20.2	23.5	15.2	17.7
Southland	19.6	15.9	9.1	7.2	12.0
All Regions	20.5	18.6	17.4	17.2	21.3

6.2 Production and Selected Costs

Table 36 shows that in 1984-85 relative to 1976-77, wheat area harvested has declined 23.6 percent while the total area in cash crop increased by 20.1 percent. Increased wheat yields of 15.7 percent plus an increase in the basic wheat price has increased gross revenue by 192.6 percent resulting in the gross margin rising by 159.9 percent. However, machinery overheads have increased by 249.7 percent, resulting in a 135.9 percent increase in gross margin less machinery overhead costs.

Table 37 compares the different components of selected costs and an attempt is made to forecast the next annual change in these costs. Total Selected Costs increased from $324 per hectare in 1979-80 to $663 per hectare in 1984-85. This represents a 104.6 percent increase over a five year period. Furthermore, costs are expected to increase a further 21.7 percent to $807 per hectare during the period 1984-85 to 1985-86.

TABLE 36

Movements in Wheat Production, Costs and Returns

	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	Index for 1984-85 (1976-77=100)
Production										
Wheat Area Harvested (ha)	22.5	21.2	19.7	22.5	21.2	20.5	18.4	17.4	17.2	76.4
Total Cash Crop Area Harvested (ha)	51.7	50.0	49.2	56.5	52.5	62.9	57.8	58.0	62.1	120.1
Total Stock Units (s.u.)	1926	1946	1889	1823	1921	1758	1864	1797	1753	91.0
Wheat Yield (t/ha)	3.89	3.72	3.39	3.60	4.35	4.40	4.70	5.00	4.50	115.7
Costs and Returns ($/ha)										
Establishment Costs	60.32	71.74	75.36	86.50	129.18	147.09	161.98	175.25	194.84	323.0
Growing Costs	16.65	20.06	26.28	30.92	50.70	101.19	87.84	102.63	130.38	831.1
Harvesting Costs	37.32	32.62	42.42	51.07	57.31	59.70	91.17	88.75	77.46	207.6
Cartage Costs	13.12	12.69	14.13	20.04	30.44	33.11	42.54	46.02	54.08	412.2
Total Variable Costs	127.32	137.11	158.19	188.53	267.63	341.09	383.53	412.65	456.76	358.7
Gross Revenue	406.72	432.50	438.06	509.78	782.94	880.29	852.28	1,067.74	1,190.23	292.6
Gross Margin	279.40	295.39	279.87	321.25	515.31	539.20	468.75	655.09	733.47	262.5
Machinery Overhead Costs	58.87	88.21	109.19	135.50	164.58	191.89	224.38	223.25	205.85	349.7
Gross Margin less Machinery Overheads	220.53	207.18	170.68	185.75	350.73	347.29	244.37	431.84	527.62	239.3

TABLE 37

Trends in Selected Costs

	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86 [a]	Change 1984-85 to 1985-86
Establishment Costs	$/ha	$/ha	$/ha	$/ha	$/ha	$/ha	$/ha	%
Cultivation	14.11	30.97	28.62	30.90	31.12	41.27	49.32	19.5
Labour	17.34	18.10	19.87	19.57	21.87	21.41	23.69	10.6
Seed	35.48	45.21	55.76	65.86	65.35	70.73	78.60	11.1
Fertiliser	19.55	34.91	42.84	45.65	56.91	61.43	67.64	10.1
Total	86.48	129.19	147.09	161.98	175.25	194.84	219.25	12.5
Growing Costs								
Harrowing and Rolling	0.19	0.79	0.39	0.44	2.92	0.71	0.85	19.5
Fertiliser	9.03	12.84	18.52	14.52	22.15	30.14	30.81	2.2
Spraying	21.52	33.29	77.93	65.83	74.24	91.09	99.66	9.4
Irrigation	0.18	3.79	4.35	7.05	3.32	8.44	7.93	-6.0
Total	30.92	50.71	101.19	87.84	102.63	130.38	139.25	6.8
Harvesting Costs								
Dessication	0.49	0.03	0.06	0.07	0.36	0.59	0.42	-29.0
Machinery and Contractor	26.15	33.66	34.15	48.96	54.70	47.73	56.40	18.2
Labour	5.93	6.93	6.70	7.65	7.85	6.42	8.39	30.6
Bags	0.65	0.65	0.40	0.39	0.42	0.00	0.40	-
Grain Drying	14.66	12.52	14.48	29.55	20.49	13.84	23.21	67.7
Insurance	3.21	3.55	3.92	4.55	4.93	8.87	10.98	23.8
Total	51.09	57.34	59.71	91.17	88.75	77.45	99.80	28.9
Cartage Costs	20.04	30.44	33.11	42.54	46.02	54.35	86.25	58.7
Total Variable Costs	188.53	267.68	341.10	383.53	412.65	457.02	544.55	19.2
Machinery Overhead Costs								
Repairs and Maintenance	13.82	39.47	41.23	51.02	55.27	49.46	64.62	30.7
Depreciation	69.20	70.87	79.38	90.54	92.05	76.98	99.88	29.8
Interest on Book Value	52.48	54.24	71.28	82.82	75.93	79.41	97.90	23.3
Total	135.50	164.58	191.89	224.38	223.25	205.85	262.40	27.5
Total Selected Costs	324.03	432.26	532.99	607.91	635.90	662.87	806.95	21.7

a To FOR until 1984-85, to FOB from 1985-86 on.

6.3 Returns

Table 38 standardises yearly revenues with respect to varying wheat yields. This is done by calculating gross revenue on the basis of a constant yield. The constant yield is assessed as the average yield over the period 1976-77 to 1984-85. An attempt is also made to estimate the 1985-86 wheat revenue on the basis of this constant yield.

Table 38 shows that over the four year period 1981-82 to 1984-85, the basic wheat price increased by 35 percent to $274 per tonne. Due to the significant increase in basic wheat price the adjusted gross margin increased by $161 per hectare to $660 per hectare. The increase in the basic wheat price therefore covered the increases in total variable costs. The adjusted gross margin less machinery overhead costs increased over the four year period, from $298 per hectare to $454 per hectare indicating that the increases in the basic wheat price have also offset increases in machinery overhead costs, given constant yields.

It is estimated for the 1985-86 season that total variable costs will increase by 19.2 percent to $545 per hectare and machinery overhead costs by 28 percent to $262 per hectare. Given these cost increases and a basic wheat price estimated at $286 per tonne, it is estimated that the gross margin less machinery overhead costs for 1985-86 will decline to $340 per hectare.

TABLE 38

Trends in Prices and Revenue

	1981-82	1982-83	1983-84	1984-85	1985-86[c]
Basic Wheat Price ($/t)	203.00	204.00	227.00	274.00	286.00
Actual Price [a] ($/t)	201.34	189.92	213.49	267.80	275.00
Actual Price (% of Basic Price)	99.2	93.1	94.1	97.7	96.0
Adjusted Gross Revenue [b] ($/ha)	839.59	791.97	890.25	1116.73	1146.75
Total Variable Costs ($/ha)	341.09	383.53	412.65	457.02	544.55
Adjusted Gross Margin ($/ha)	498.50	408.44	477.60	659.71	602.20
Machinery Overhead Costs ($/ha)	191.89	224.38	223.25	205.85	262.40
Adjusted Gross Margin less Machinery Overhead Costs ($/ha)	298.55	176.46	245.81	453.86	339.80

a Actual price received per tonne by growers taking into account variety premiums and discounts. Includes discounts for undergrade wheat.

b Basic price times constant yield. The yield was the "All Regions" average yield 1976-77 to 1984-85, i.e. 4.17 t/ha.

c Based on ASW price of $US132 per tonne and US/NZ dollar rate of 0.46.

APPENDICES

APPENDIX A

REGIONAL CLIMATIC DATA

TABLE 39

Weather Indices for Manawatu Wheat Growing Area[a]
1984-85

Month	Rainfall	Average Temperature	Days of deficit[b]	Sunshine
	Percent of normal[c]	Deviation from normal[c] (°C)	Days	Percent of normal[c]
March	171	+0.7	1.1	95
April	78	0.0	0.0	112
May	102	-0.1	0.0	102
June	100	+1.8	0.0	70
July	99	+1.3	0.0	91
August	55	+1.1	0.0	108
September	71	0.0	0.0	95
October	40	-0.3	0.0	104
November	90	+1.5	0.0	97
December	49	+1.7	0.0	116
January	136	+1.2	0.0	100
February	83	0.0	0.0	103
March	41	-0.5	15.3	106
April	83	-0.1	18.0	105

a Weighted by county wheat areas in 1967/68

b The number of "days of deficit" is calculated from daily rainfall data by assuming that evapotranspiration continues at the Thornthwaite potential evapotranspiration rate until 75 mm of soil moisture have been withdrawn. Thereafter, days of deficit are counted until there is a day with rainfall in excess of the daily potential evapotranspiration.

c 1951-80

Source: Maunder, W.J., N.Z. Meteorological Service, pers. comm., 1985.

TABLE 40

Weather Indices for North and Mid Canterbury Wheat Growing Areas,[a] 1984-85

Month	Rainfall	Average Temperature	Days of Deficit[b]	Sunshine
	Percent of normal[c]	Deviation from normal[c] (°C)	Days	Percent of normal[c]
March	218	+0.7	0.8	81
April	26	+0.1	0.6	116
May	71	-1.3	0.1	105
June	28	+1.7	0.0	112
July	119	+1.2	0.0	72
August	51	+1.5	0.0	105
September	56	+0.2	0.0	89
October	70	+0.2	0.0	110
November	133	+1.4	2.6	99
December	91	+0.8	1.2	93
January	27	+2.3	23.2	117
February	94	+0.7	15.5	115
March	69	-0.2	13.8	115
April	32	+1.2	19.3	118

a Weighted by county wheat areas in 1967/68.

b The number of "days of deficit" is calculated from daily rainfall data by assuming that evapotranspiration continues at the Thornthwaite potential evapotranspiration rate until 75 mm of soil moisture have been withdrawn. Thereafter, days of deficit are counted until there is a day with rainfall in excess of the daily potential evapotranspiration.

c 1951-80.

Source: Maunder, W.J., N.Z. Meteorological Service, pers. comm., 1985.

TABLE 41

Weather Indices for South Canterbury and North Otago Wheat Growing Areas,[a] 1984-85

Month	Rainfall	Average Temperature	Days of Deficit[b]	Sunshine
	Percent of normal[c]	Deviation from normal[c] (°C)	Days	Percent of normal[c]
March	114	+0.5	11.0	80
April	40	+0.2	13.9	115
May	82	-1.0	0.1	107
June	30	+1.5	0.0	112
July	104	+0.8	0.0	72
August	73	+1.1	0.0	98
September	57	-0.3	0.0	101
October	42	+0.1	3.2	117
November	93	+1.5	5.3	97
December	102	+0.4	3.5	85
January	45	+1.7	22.2	102
February	73	+0.4	18.7	105
March	33	-0.5	24.0	112
April	14	+0.9	26.8	116

a Weighted by county wheat areas in 1967/68.

b The number of "days of deficit" is calculated from daily rainfall data by assuming that evapotranspiration continues at the Thornthwaite potential evapotranspiration rate until 75 mm of soil moisture have been withdrawn. Thereafter, days of deficit are counted until there is a day with rainfall in excess of the daily potential evapotranspiration.

c 1951-80.

Source: Maunder, W.J., N.Z. Meteorological Service, pers. comm., 1985.

TABLE 42

Weather Indices for Southland Wheat Growing Areas,[a] 1984-85

Month	Rainfall	Average Temperature	Days of Deficit[b]	Sunshine
	Percent of normal[c]	Deviation from normal[c] (°C)	Days	Percent of normal[c]
March	160	+0.7	0.0	78
April	129	+0.6	0.0	98
May	133	-0.9	0.0	71
June	47	+1.4	0.0	101
July	67	+0.6	0.0	65
August	177	+0.9	0.0	95
September	129	+0.1	0.0	115
October	115	-0.1	0.0	94
November	103	+1.1	0.0	102
December	122	+0.7	0.0	104
January	151	+1.2	0.0	75
February	116	+0.3	0.0	96
March	64	-0.4	0.0	105
April	78	+0.6	0.0	97

a Weighted by county wheat areas in 1967/68.

b The number of "days of deficit" is calculated from daily rainfall data by assuming that evapotranspiration continues at the Thornthwaite potential evapotranspiration rate until 75 mm of soil moisture have been withdrawn. Thereafter, days of deficit are counted until there is a day with rainfall in excess of the daily potential evapotranspiration.

c 1951-80.

Source: Maunder, W.J., N.Z. Meteorological Service, pers. comm., 1985.

APPENDIX B

RELIABILITY OF SURVEY ESTIMATES

Due to sampling error, estimates of farm characteristics based on a sample of farms are likely to differ from figures which would have been obtained had information been collected from all farms in the population. However, since the sample was selected probabilistically, sampling theory can be used to compute this sampling error. A summary measure that captures this error is the relative standard error (R.S.E.) defined as the standard deviation of the estimate divided by the estimated mean. The smaller the R.S.E., the more reliable the estimate.

Table 43 reports the mean and R.S.E. of the important cost and revenue items. For example, the table shows the "All Regions" average survey farm having a gross margin of $733.48 per hectare, with a R.S.E. of 3.43 percent. In other words one can be 95 percent certain that the true value of the "All Regions" average mean gross margin per hectare lies within the range 1.96 x 3.43 percent x $733.48 either side of the estimated figure; that is, within $733.48 + or - $49.31. The North Island figures should be interpreted with caution due to the small sample size.

TABLE 43

Reliability of Summary Wheat Costs and Returns, 1984-85

	North Island	Central Canterbury	South Canterbury	Southland	All Regions
Number of Survey Farms which Harvested Wheat	14	62	25	25	126
Establishment Costs					
- Mean ($/ha)	231.74	164.80	180.61	229.99	194.84
- R.S.E. (%)	10.71	5.05	7.45	8.68	7.00
Growing Costs					
- Mean ($/ha)	90.10	172.19	78.98	118.48	130.38
- R.S.E. (%)	12.56	5.05	9.23	8.79	7.50
Harvesting Costs					
- Mean ($/ha)	118.43	41.04	45.81	128.78	77.45
- R.S.E. (%)	18.84	8.73	13.30	12.29	11.33
Cartage Costs					
- Mean ($/ha)	45.22	49.66	36.68	73.53	54.08
- R.S.E. (%)	19.37	9.29	15.16	18.72	14.05
Total Variable Costs					
- Mean ($/ha)	485.49	427.69	342.08	550.78	456.75
- R.S.E. (%)	6.96	1.70	4.07	4.10	3.23
Machinery Overhead Costs (Current)					
- Mean ($/ha)	136.52	202.89	196.20	243.08	205.85
- R.S.E. (%)	13.30	6.39	10.29	10.08	8.73
Total Selected Costs					
- Mean ($/ha)	622.01	630.59	538.28	793.86	662.60
- R.S.E. (%)	7.00	1.70	4.07	4.10	3.23
Gross Revenue					
- Mean ($/ha)	1165.85	1202.52	942.31	1323.69	1190.23
- R.S.E. (%)	19.10	8.36	14.68	14.93	12.33
Gross Margin					
- Mean ($/ha)	680.36	774.82	600.23	772.91	733.48
- R.S.E. (%)	7.42	1.68	4.64	4.31	3.43
Gross Margin Minus Machinery Overhead Costs					
- Mean ($/ha)	543.84	571.93	404.03	529.83	527.63
- R.S.E. (%)	7.48	1.73	5.45	4.86	3.80

APPENDIX C

BREAKDOWN OF COST ITEMS

The breakdown of the costs and returns for the wheat crop (Table 25) is detailed in Tables 44 to 47. A description of the items used in these tables is given in Appendix D.

TABLE 44

Establishment Costs, 1984-85

	Average Cost per Farm ($/ha)					
	N.I.	Central Canterbury	South Canterbury	South-land	All Regions	National Average
Number of Survey Farms which Harvested Wheat	14	62	25	25	126	126
Item						
a. Cultivation and Drilling - Tractor Running	30.09	42.64	49.26	33.82	39.61	38.86
b. Cultivation and Drilling - Labour	18.08	20.11	25.99	21.91	21.41	19.29
c. Cultivation - Contractor	2.64	0.68	0.00	2.42	1.32	0.58
d. Drilling - Contractor	1.07	0.10	0.00	0.55	0.34	0.12
e. Seed	97.12	54.50	58.78	83.53	68.81	59.29
f. Seed Cartage	2.01	1.18	2.13	2.77	1.92	1.49
g. Fertiliser	76.56	43.26	40.27	79.00	57.47	52.70
h. Fertiliser Cartage	4.17	2.33	4.18	5.99	3.96	3.15
Total Establishment Costs	231.74	164.80	180.61	229.99	194.84	175.48

TABLE 45

Growing Costs, 1984-85

	Average Cost per Farm ($/ha)					
	N.I.	Central Canterbury	South Canterbury	South-land	All Regions	National Average $/ha
Number of Survey Farms which Harvested Wheat	14	62	25	25	126	126
Item						
a. Harrowing and Rolling - Tractor Running	0.21	0.49	1.31	0.11	0.48	0.42
b. Harrowing and Rolling - Labour	0.15	0.25	0.59	0.02	0.23	0.16
c. Fert. Topdressing - Tractor Running	0.40	0.91	0.19	3.26	1.43	1.62
d. Fert. Topdressing - Labour	0.23	0.53	0.12	0.30	0.36	0.43
e. Fert. Topdressing - Contractor	2.44	3.87	1.00	1.60	2.53	3.55
f. Fertiliser	10.28	41.94	7.97	16.63	24.77	36.68
g. Fertiliser Cartage	0.13	1.63	0.35	1.01	1.05	1.56
h. Spraying - Tractor Running	1.55	1.24	1.41	1.56	1.40	1.44
i. Spraying - Labour	0.79	0.98	0.80	0.86	0.89	1.06
j. Spraying - Contractor	13.55	18.73	14.75	26.70	19.82	18.06
k. Weedicide - Material	32.86	39.23	23.57	26.40	31.95	37.68
l. Insecticide - Material	11.67	6.04	1.01	0.56	4.22	5.46
m. Fungicide - Material	15.84	36.51	24.69	39.14	32.81	35.36
n. Irrigation - Running	0.00	15.42	1.21	0.33	6.63	8.25
o. Irrigation - Tractor Running	0.00	4.28	0.00	0.00	1.75	2.50
p. Irrigation - Labour	0.00	0.15	0.00	0.00	0.06	0.06
Total Growing Costs:	90.10	172.19	78.98	118.48	130.38	154.29

TABLE 46

Harvesting Costs, 1984-85

	Average Cost per Farm ($/ha)					
	N.I.	Central Canterbury	South Canterbury	South-land	All Regions	National Average $/ha
Number of Survey Farms which Harvested Wheat	14	62	25	25	126	126
Item						
a. Dessication - Material	0.00	0.39	0.17	1.31	0.58	0.56
b. Dessication - Tractor Running	0.00	0.03	0.00	0.00	0.01	0.03
c. Dessication - Contractor	0.00	0.00	0.00	0.00	0.00	0.00
d. Header - Fuel	1.23	4.90	6.63	5.62	4.97	5.27
e. Header - Tractor Running	0.00	1.09	1.13	2.92	1.52	0.64
f. Harvesting - Labour	1.14	5.57	8.29	8.62	6.42	6.28
g. Harvesting - Contractor	103.73	11.30	17.07	54.90	36.45	19.14
h. Paddock to Silo - Truck Fuel	0.17	0.20	0.18	0.27	0.21	0.21
i. Paddock to Silo - Tractor	0.75	5.89	1.53	2.29	3.45	3.58
j. Paddock to Silo - Truck Hire	0.00	2.76	0.00	0.00	1.13	2.02
k. Bags (net)	0.00	0.00	0.00	0.00	0.00	0.00
l. Grain Drying - Own	0.00	0.00	0.85	9.99	3.14	2.54
m. Grain Drying - Contractor	2.29	0.00	2.88	33.13	10.70	3.78
n. Crop Insurance	9.11	8.92	7.07	9.73	8.87	9.14
Total Harvesting Costs:	118.43	41.04	45.81	128.78	77.45	53.19

TABLE 47

Machinery Overhead Costs, 1984-85

	Average Cost per Farm ($/ha)					
	N.I.	Central Canterbury	South Canterbury	South-land	All Regions	National Average $/ha
Number of Survey Farms which Harvested Wheat	14	62	25	25	126	126
Item						
a. Repairs and Insurance	33.86	44.68	52.16	60.69	49.46	45.92
b. Depreciation at 15% diminishing value (current value)	50.54	78.53	71.14	88.75	76.98	74.46
c. Interest on capital at 16.14% Cost	52.12	79.69	72.90	93.64	79.41	76.07
Total Machinery Overhead Costs	136.52	202.89	196.20	243.08	205.85	196.45

APPENDIX D

DESCRIPTION OF COST ITEMS

1. Establishment Costs

(a) Cultivation and Drilling - Tractor running:

Tractor running costs for survey farms were estimated as follows:

For tractors 60 h.p. or less, running cost = $7.78 per hour.

For tractors 61-85 h.p., running cost = $9.95 per hour.

For tractors greater than 85 h.p., running cost = $14.39 per hour

These costs included diesel fuel costed at 65.5 cents per litre but excluded insurance, registration and any major repairs.

(b) Cultivation and Drilling - Labour:

Total labour time for cultivation and drilling was determined from the tractor hours and the number of people involved. This time was costed at $5.75 per hour based on the average salary ($10,855) of full time employees on survey farms, plus an allowance of $55 per week for housing etc.

(c) Cultivation and Drilling - Contractor:

The actual amount paid for any contract work was used.

(d) Seed:

For each farm the total seed cost was the sum of purchased and farm grown seed. The cost of purchased seed was taken to be the actual retail seed price which included any costs for dressing, treating, and bags. The cost of farm grown seed was generally taken as the previous year's milling price plus any storage increments which would have accrued up to the sowing date plus any costs related to dressing and treating the seed. An exception to this method was made where the wheat seed was retained from a crop grown specifically for seed in which case the actual value of the seed was used.

(e) Seed Cartage:

This is the cost of transporting seed to the farm. Where a grower used his own transport this was charged at the appropriate commercial rate for the area.

RECENT PUBLICATIONS

RESEARCH REPORTS

133. *Alternative Management Strategies and Drafting Policies for Irrigated Canterbury Sheep Farms,* N.M. Shadbolt, 1982.

134. *Economics of the Sheep Breeding Operations of the Department of Lands and Survey,* A.T.G. McArthur, 1983.

135. *Water and Choice in Canterbury,* K.L. Leathers, B.M.H. Sharp, W.A.N. Brown, 1983

136. *Survey of New Zealand Farmer Intentions and Opinions, October-December, 1982,* J.G. Pryde, P.J. McCartin, 1983.

137. *Investment and Supply Response in the New Zealand Pastoral Sector: An Econometric Model,* M.T. Laing, A.C. Zwart, 1983

138. *The World Sheepmeat Market: an econometric model,* N. Blyth, 1983.

139. *An Economic Survey of New Zealand Town Milk Producers, 1981-82,* R.G. Moffitt, 1983.

140. *Economic Relationships within the Japanese Feed and Livestock Sector,* M. Kagatsume, A.C. Zwart, 1983.

141. *The New Zealand Arable Sector: Foreign Exchange Implications,* R.D. Lough, W.A.N. Brown, 1983.

142. *An Economic Survey of New Zealand Wheatgrowers: Enterprise Analysis, Survey No. 7, 1982-83,* R.D.Lough, P.J. McCartin, 1983.

143. *An Economic Survey of New Zealand Wheatgrowers: Financial Analysis, 1981-82,* R.D. Lough, P.J. McCartin, 1983.

144. *Development of the South Canterbury-Otago Southern Bluefin Tuna Fishery,* D.K. O'Donnell, R.A. Sandrey, 1983.

145. *Potatoes: A Consumer Survey of Auckland, Wellington and Christchurch Households,* R.L. Sheppard, S.A. Hughes, 1983.

146. *Potatoes: Distribution and Processing,* S.A. Hughes, R.L. Sheppard, 1983.

147. *The Demand for Milk: An Econometric Analysis of the New Zealand Market,* R.J. Brodie, R.G. Moffitt, J.D. Gough, 1984.

148. *The Christchurch and New Zealand Eating Out Markets,* A. van Ameyde, R.J. Brodie, 1984.

149. *The Economics of Controlling Gorse in Hill Country: Goats versus Chemicals,* M.A. Krause, A.C. Beck, J.B. Dent, 1984.

150. *The World Market for Fruit Juice Products: Current Situation and Prospects,* M.T. Laing, R.L. Sheppard, 1984.

151. *The Economics of Controlled Atmosphere Storage and Transport for Nectarines, Apples and Kiwifruit,* M.T. Laing, R.L. Sheppard, 1984.

152. *Survey of New Zealand Farmer Intentions and Opinions. October-December, 1983,* J. G. Pryde, P. J. McCartin, 1984.

153. *Dynamics of Herd Buildup in Commercial Deer Production,* R. A. Sandrey, A. C. Zwart, 1984.

154. *The Economics of Farm Accidents and Safety in New Zealand Agriculture,* K. L. Leathers, J. D. Williams, 1984

155. *An Information System for the Control of Brown Rust in Barley,* P. K. Thornton, J. B. Dent, A. C. Beck, 1984

156. *An Assessment of the Effects of Road Dust on Agricultural Production Systems,* P.R. McCrea, 1984

157 *An Economic Survey of New Zealand Town Milk Producers, 1982-83,* R. G. Moffitt, 1984

158. *The Optimal Location of Egg Production in New Zealand,* A.C. Beck, J.P. Rathbun, C.D. Abbott, 1984.

159. *The Economics of Irrigation Development of the Amuri Plains Irrigation Scheme,* Glen Greer, 1984.

160. *An Economic Survey of New Zealand Wheatgrowers: Enterprise Analysis, Survey No. 8, 1983-84,* R.D. Lough, P.J. McCartin, 1984.

161. *An Economic Survey of New Zealand Wheatgrowers: Financial Analysis, 1982-83,* R.D. Lough, P.J. McCartin, 1984.

162. *Farmland Pricing in an Inflationary Economy with Implications for Public Policy,* K.L. Leathers, J.D. Gough, 1984.

163. *An Analysis of Production, Consumption and Borrowing Behaviour in the North Island Hill Country Pastoral Sector,* A.C. Beck, J. B. Dent, 1984.

164. *New Zealand's Inshore Fishery: a Perspective on the Current Debate,* R.A. Sandrey, D.K. O'Donnell, 1985.

165. *Land Policy and Land Settlement in New Zealand,* J. R. Fairweather, 1985.

166. *Farm Enlargement in New Zealand,* J.R. Fairweather, 1985.

167. *Survey of New Zealand Farmer Intentions and Opinions, October - December, 1984,* J.G. Pryde, P.J. McCartin, 1985.

168. *Market Prospects for Maize,* S.A. Hughes, R.L. Sheppard, 1985.

169. *Factor Cost Analysis of a New Zealand Meat Processing Company,* M.D. Clemes, L.D. Woods, 1985.

170. *An Economic Survey of New Zealand Wheatgrowers: Enterprise Analysis, Survey No. 9, 1984-85,* R.D. Lough, P.J. McCartin, 1985.

171. *An Economic Survey of New Zealand Wheatgrowers: Financial Analysis, 1983-84,* R.D. Lough, P.J. McCartin, 1985.

DISCUSSION PAPERS

74. *Tractor Replacement Policies and Cost Minimisation,* P.L. Nuthall, K.B. Woodford, A.C. Beck, 1983.

75. *Tomatoes and the Closer Economic Relationship with Australia,* R.L. Sheppard, 1983.

76. *A Survey of Farmers' Attitudes to Information,* R.T. Lively, P.L. Nuthall,1983.

77. *Monetary Policy and Agricultural Lending by Private Sector Financial Institutions,* R.L. St. Hill, 1983.

78. *Recreational Substitutability and Carrying Capacity for the Rakaia and Waimakariri Rivers,* B. Shelby, 1983.

79. *"Consider Japan": Papers from a Seminar Conducted by the Japan Centre of Christchurch,* Edited by R.G. Moffitt,1984.

80. *Deregulation: Impact on the Christchurch Meat Industry,* R.L. Sheppard, D.E. Fowler, 1984.

81. *Farmers Record Keeping and Planning Practices: a postal survey,* J.Ryde, P.L. Nuthall, 1984.

82. *The State of Agricultural Credit in New Zealand,* J. G. Pryde, L. B. Bain, 1984.

83. *The Future of the Common Agricultural Policy and its Implications for New Zealand,* E. A. Attwood, 1984.

84. *The Economic Potential of Growth-Promoting Agents in Beef,* D. E. Fowler, 1984

85. *Some Aspects of the Farm Income Situation in New Zealand,* E.A. Attwood, 1984

86. *Financing New Zealand Horticulture,* J.G. Pryde, L.B. Bain, 1984

87. *The New Zealand Farm Business and the Current Changes in its Structure,* E.A. Attwood, 1984.

88. *The Agricultural Sector in New Zealand – a Joint Farm - Industrial Perspective,* S.E. Guthrie, R.G. Lattimore, 1984.

89. *The Current Situation and Policies of the New Zealand Cereals Sector,* E.A. Attwood, 1984.

90. *The Current Situation and Future Development of the New Zealand Pig Industry,* E.A. Attwood, 1985.

91. *North Island Maize Production, 1983-84,* R.D. Lough, 1985.

92. *The Sandwich Algorithm for Spatial Equilibrium Analysis,* J.P. Rathbun, A.C. Zwart, 1985.

93. *A Review of Agricultural Credit in New Zealand,* J.G. Pryde, L.B. Bain, 1985.

94. *New Zealand Economic Development: a brief overview of unbalanced industry growth,* R.G. Lattimore, 1985.

95. *Economic Aspects of Agricultural Education and Training in New Zealand,* E.A. Attwood, 1985.

96. *Supply Response Parameters in New Zealand Agriculture – a Literature Search,* M. Wood-Belton, R.G.J. Lattimore, 1985.

Additional copies of Research Reports, apart from complimentary copies, are available at $12.00 each. Discussion Papers are usually $8.50 but copies of Conference Proceedings (which are usually published as Discussion Papers) are